

CONTRIBUTIONS TO A KNOWLEDGE OF AUSTRALIAN ENTOZOA.

No. ii.—ON A NEW SPECIES OF *Distomum* FROM THE SAWFISH SHARK, *Pristiophorus cirratus*, Lath.

BY S. J. JOHNSTON, B.A., B.Sc., ECONOMIC ZOOLOGIST,
TECHNOLOGICAL MUSEUM, SYDNEY.

(Plate xiii.)

I am indebted to Professor Haswell for three specimens of this Trematode, which were found in the body cavity of the Sawfish Shark, *Pristiophorus cirratus*, Lath., at Sydney. I have examined several specimens of the same host since receiving those from Professor Haswell, but have found no Distomes, though in the body cavity of one specimen a number of eggs were found which very probably belong to the same species, for the eggs with their very thick shells are characteristic of the species; the worms may have escaped through the abdominal pores when the fish was caught. This worm has a very extensible neck; fastening itself by the ventral sucker it stretches its neck out for more than an inch, longer than the body itself.

DISTOMUM PRISTIOPHORI, sp.n.

Body elongated, pointed at the anterior end, and rounded at the posterior, flattened dorsoventrally, with rounded sides; head-lobe triangular. Average length 25 mm., breadth 6 mm.

Oral sucker deep, cup-shaped and small; subterminal, the opening being on the ventral aspect; diameter 1.5 mm. Ventral sucker orbicular, sessile, with deep cavity, larger than oral

sucker; diameter 2.5 mm. Both suckers very muscular, devoid of hooks or lobes of any kind.

Common genital aperture situated near the middle line about half-way between the oral and ventral suckers. Excretory aperture situated at the extreme posterior end. Laurer's canal opening on the dorsal surface about the middle of the body.

Cuticle with a transversely striated appearance owing to fine closely arranged grooves running round the worm.

Alimentary canal simple; mouth situated at the base of the oral sucker, leading into a well developed, muscular pharynx; behind the pharynx the canal immediately divides into the two limbs of the intestine, the œsophagus being practically non-existent. Limbs of the intestine unbranched, but not quite simple, being thrown into bays and folds throughout their length; they terminate in blind sac-like ends at the posterior end of the body. Walls of the intestine thick, lined by long columnar cells, nucleated at the base, of a glandular character.

Excretory system very well developed, consisting of two main canals which run forwards and unite in front of the oral sucker. In the anterior half of the body these excretory vessels run laterally; but some distance behind the testes they bend inwards and meet about the middle line to form a single median vessel, which opens into a large excretory vesicle in the posterior end of the body. A number of constrictions occur along the excretory canals. The excretory vesicle opens on the exterior through a very short canal, ending in the excretory pore. The excretory canals were partly filled up with crystals belonging to the cubical system, and which had become stained by eosin; some envelope crystals of calcium oxalate were present.

Testes two, situated just posterior to the middle of the body, ovoid in shape; lying almost on the same level. The undeveloped sperms give their interior that follicular appearance usual in Trematodes, but there is also a large number of fully developed sperms present. Each vas deferens, passing dorsal to the uterus and ventral sucker, joins its fellow at the origin of the vesicula seminalis, which is large and pear-shaped, and filled with fully

developed spermatozoa with small round heads and long tails. The vesicula seminalis is continued as the ejaculatory duct which traverses the penis to open on the exterior. The vesicula seminalis and the proximal part of the ejaculatory duct are surrounded by a strong muscular sac; the somewhat considerable space between the walls of the vesicula seminalis and this sac are traversed by muscular and connective tissue fibres which join the walls of each. Between the fibres lie a number of glandular cells representing a prostate gland.

The male and female ducts open close together into the common genital chamber, which is of some size, and which opens on the exterior on the ventral surface on the middle line and half-way between the two suckers.

The ovary is an ovoid body of solid appearance lying just anterior to the testes. In the walls of the distal part of the oviduct the shell glands are situated, and this part of the oviduct constitutes the ootype. Into the end nearest the ovary Laurer's canal opens; about its middle the main duct of the vitelline glands.

The uterus is a very long and narrow tube which is thrown into a considerable number of folds between the ovary and ventral sucker; skirting the side of the ventral sucker it runs forwards to open alongside the male opening into the common genital chamber. There is no vagina. The uterus is full of eggs, which are characterised by a very thick chitinous shell. The average longitudinal diameter of the eggs is 0.077 mm., transverse 0.062 mm.; the thickness of the shell is 0.008 mm. The eggs consist of the ovum and three or four large vitelline cells.

The vitelline glands are a number of small, rounded, grape-like follicles which communicate with one another by small ducts. A main lateral duct on each side, about the level of the ovary, opens into a median duct; these median ducts meet together and open into the ootype by a single opening. The follicles are situated laterally, in the middle third of the body, and are grouped round the intestine on each side of the body. The vitelline mass consists of large nucleated cells of an albuminous character.

Laurer's canal, a canal with muscular walls, opens on the exterior about the middle of the dorsal surface, opposite the middle of the ovary. It skirts round the right side of the ovary and opens into the proximal end of the ootype. In its interior a number of sperms can be seen. The canal is quite large enough to be used in copulation.

The most characteristic features of the worm are its size, the character and position of the suckers, the folded but unbranched intestine, the ovoid shape of the ovary and testes and their situation, the great length of the uterus, the grape-like vitelline glands, and the well developed excretory system.

The simple nature of the intestine, the absence of hooks or lobes from the suckers, the almost total obliteration of the œsophagus, and the absence of a retractile telescopic tail part indicate the position of this species to be in Dujardin's subgenus *Brachylaimus*.

In external characters, as general shape, size, character and position of the suckers and transversely striated appearance, it closely resembles *D. veliporium*, Creplin, found in the American barn-door skate, *Raja levis*, in *Prionodon milberti*, and in *Hexarchus griseus*. In its internal anatomy it shows a fairly close resemblance to *D. tereticolle*, Rud. The excretory system is very marked and very similar in each. The limbs of the intestine in *D. tereticolle* are without the folds shown in *D. pristiophori*. They both have the uterus long, slender and much folded, and a similar structure, arrangement and amount of development in the vitelline glands; in this new species the ovary and testes are situated much nearer together.

The figures for the plate were drawn by my wife.

EXPLANATION OF PLATE XIII.

Distomum pristiophori.

Fig. 1.—View of the whole animal ($\times 6$).

Fig. 2.—Transverse section through the middle of the ventral sucker ($\times 15$)

Fig. 3.—Transverse section through posterior end showing the large excretory vesicle ($\times 20$).

Fig. 4.—Transverse section through the vesicula seminalis and its surrounding sac ($\times 50$).

Fig. 5.—Transverse section through the anterior end showing common genital opening and chamber ($\times 15$).

Fig. 6.—Portion of the worm showing termination of genital ducts ($\times 20$).

Fig. 7.—Transverse section through the ovary showing Laurer's canal, ootype and vitelline duct ($\times 20$).

All, except fig. 1, drawn with the camera lucida.

Reference letters.

c.g.c., common genital chamber.—*c.*, cirrus.—*ej.d.*, ejaculatory duct.—*ex.c.*, excretory canal.—*ex.v.*, excretory vesicle.—*g.p.*, genital aperture.—*int.*, intestine.—*L.C.*, Laurer's Canal.—*m.s.*, muscular sac.—*oo.*, ootype.—*o.s.*, oral sucker.—*ov.*, ovary.—*ovid.*, oviduct.—*ph.*, pharynx.—*pr.g.*, prostate gland.—*s.g.*, shell glands.—*t₁ & t₂*, testes.—*ut.*, uterus.—*v.d.*, vas deferens.—*v.g.*, vitelline glands.—*vit.d.*, vitelline duct.—*v.s.*, ventral sucker.
v.sem., vesicula seminalis.